

Greetings and welcome to the **June 2013** edition of the WDFW Climate News Digest. The purpose of this digest is to provide highlights of relevant climate change news, events and resources for WDFW staff. Feedback or suggestions for items to include in future editions are much appreciated – many *thanks* to those who have sent links and references and please keep them coming. Note that previous editions of the newsletter are now stored on the Habitat Program Sharepoint site --

<http://sharepoint.dis.wa.gov/dfw/habitat/climatechange/default.aspx>.

WHAT'S HAPPENING AT WDFW?

Selected projects, agency resources and initiatives

WDFW and the Northwest Power and Conservation Council's Fish and Wildlife Program

The first draft of WDFW's recommendations for the Northwest Power and Conservation Council's Fish and Wildlife Program include a recommendation that the Council take a leadership role on identifying actions that will help to increase the resilience of priority species and habitat to the impacts of climate change, and seek to integrate climate considerations into relevant policy, procedures and decision making processes.

Climate Science and the proposed listing of the Wolverine

WDFW recently provided comments to USFWS regarding the proposed listing of the Wolverine as a federally threatened species. The proposal was significant because projected loss of snowpack and resulting habitat fragmentation due to climate change were cited as the primary threat and the driver for the proposal. For example, female wolverines use deep snow that persists through mid-spring for dens to raise their young. Available research estimates that the extent of areas with persistent spring snowpack may recede by 33 percent by 2045 and up to 63 percent by 2099. The process sparked much discussion among the Western States about the role and credibility of climate science and the appropriate use of future projections to drive a federal listing. Regarding climate change, WDFW comments acknowledged the threat climate change poses to conservation efforts, and cited our agency efforts to include climate considerations in decision making. The agency also concurred with several other states in calling for a more robust discussion of the uncertainty inherent in future climate projections and how to address it in federal listing decisions under the Endangered Species Act. For more information, contact Eric Gardner, Wildlife Diversity Section Manager.

CLIMATE ADAPTATION AT OTHER ORGANIZATIONS

NOAA Launches Redesigned Climate.Gov Website and Offers Communication Pathways for Online Users

NOAA's climate.gov website provides science and information for a climate-smart nation. It has recently been completely re-designed based upon public feedback. Each section has refined its user interface, enhanced its functionality, and expanded its scope of contents. The website aims to promote the public's understanding of climate science and climate-related events, to make NOAA data products and services easy to access and use, to provide climate-related support to the private sector and the Nation's economy, and to serve people making climate-related decisions with tools and resources that help them answer specific questions. To learn more, visit: <http://www.climate.gov/>.

US Department of Agriculture to provide climate-related technical assistance

USDA Secretary Vilsack has announced the intent to create seven “regional climate hubs” to provide technical assistance and other services to key USDA constituencies, focused on agriculture, livestock, and forestry. Below are links to the USDA press release and a fact sheet.

<http://usda.gov/wps/portal/usda/usdahome?contentid=2013/06/0114.xml&contentidonly=true>
http://www.usda.gov/oce/climate_change/regional_hubs.htm

A USDA report in February concluded average temperatures in the main U.S. growing regions may rise 4 degrees to 6 degrees Fahrenheit (2 degrees to 3 degrees Celsius) in the next four decades, outpacing nationwide trends. The department will create seven regions, each responsible for developing specific ways to mitigate climate issues. The regions will be coordinated within the USDA extension system, which works with universities to support agriculture. The USDA also will calculate the carbon content of farmland to determine which management practices boost soil quality and limit greenhouse-gas emissions

EPA's Science Matters Newsletter Focuses on Climate Change Research

The current issue of EPA's Science Matters focuses on how EPA researchers and partners are developing the latest climate change science and incorporating it into strategies and actions to protect human health and the environment. The issue includes stories on: using climate models and watershed simulations to better understand climate change effects on streams and rivers; protecting salmon from warming waters in the South Fork Nooksack River Watershed; as well as a Q&A podcast with the Associate Director for Climate for the Air, Climate, and Energy Research Program. To view this issue of Science Matters, visit: <http://epa.gov/sciencematters/>

Institute for Tribal Environmental Professionals (ITEP) Launches Tribal Climate Change Website, Newsletter, Webinars, and Regional Adaptation Courses

The Institute for Tribal Environmental Professionals has launched a website to provide information and resources tailored to helping Native people gain a better understanding of climate change and its impacts on their communities. The website includes basic climate change information; profiles of Tribes in diverse regions of the United States, including Alaska, who are coping with climate change impacts; audio files of elders discussing the issue from traditional perspectives; and resources and contacts to use in developing climate change mitigation and adaptation strategies. A monthly newsletter, to which one can subscribe, provides announcements about funding opportunities, conferences, training, and other information relevant to tribal climate change issues. A number of upcoming trainings, courses, and webinars are also mentioned on the site, including one on Climate Change Adaptation Planning. To learn more, visit: <http://www4.nau.edu/tribalclimatechange/index.asp>.

LEARNING OPPORTUNITIES

Monday, June 24th, 10:00-11:00 AM (PDT), “Riparian Mapping for Climate Adaptation Potential – part I”

This is the first of two upcoming webinars (See July 31st below) to introduce the final reports and products of a Riparian Mapping Project, sponsored by the Western Governors Association and two Landscape Conservation Cooperatives (LCCs). The products are an effort to develop high-resolution maps of potential riparian areas, their condition, and their climate adaptation potential, for the Pacific Northwest (Hydrologic Region 17). The June 24th webinar features David Theobald (Conservation Science Partners) who will present methods and results for potential riparian area and condition

mapping. For more information, contact Meade Krosby, PhD, Department of Biology, Climate Impacts Group, mkrosby@u.washington.edu.

WEBEX info: Meeting Number: 928 925 765, Meeting Password: riparian1

1. Go to

<https://wadismeetings.webex.com/wadismeetings/j.php?ED=228750122&UID=1609317012&PW=NZDNjMTRjYTNj&RT=MiM0>

2. If a password is required, enter the meeting password: riparian1

To join the audio conference only: Call-in toll-free number (US/Canada): 1-877-668-4493,

Access code: 928 925 765

For assistance, Go to <https://wadismeetings.webex.com/wadismeetings/mc>

Tuesday, June 25, Climate Change Impacts on Tribes, 11:00-12:15 PDT.

Institute for Tribal Environmental Professionals Webinar with Bull Bennett, President, Kiksapa Consulting; Nancy Maynard, Emeritus Scientist, NASA; Patricia Cochran, Executive Director, Alaska Native Science Commission; Kathy Lynn, Project Coordinator, PNW Tribal Climate Change Project, University of Oregon; and Sue Wotkyns, Climate Change Program Manager, Institute for Tribal Environmental Professionals, Northern Arizona University. [Read more and register here](#)

Tuesday, July 9th, 12:00 PDT, “Can Camouflage Keep up with Climate Change? Connecting Downscaled Climate Models to Adaptation for a Key Forest Species

Michael Mitchell and Scott Mills, University of Montana. This presentation features a research project to study a striking effect of climate change on wildlife, whereby seasonal coat color becomes mismatched with lack of snow. To date the study has quantified molt phenology, mismatch, behavioral plasticity, and fitness costs of mismatch for snowshoe hares over 3 years at two sites in Montana. [Read more.](#) [Register here.](#)

Thursday, July 25th, 11:00 PDT, Webinar Demonstration of Coastal Adaptation to Sea Level Rise Tool.

This demonstration of the COAST tool (Coastal Adaptation to Sea level rise) is hosted by the Ecosystem Based Management Tools Network and will be presented by Sam Merrill and JT Lockman of Catalysis Adaptation. COAST helps predict and visualize damages from ranges of sea level rise and storm surge frequency and intensity and the relative benefits of candidate adaptation responses. COAST output is in the form of Google Earth-compatible files and tables showing costs versus benefits (avoided costs) of stakeholder-derived adaptation scenarios. The free software is available online, along with a user's manual and tutorial data sets, at <http://efc.muskie.usm.maine.edu/pages/coast.html>
Reserve your Webinar seat at: <https://www1.gotomeeting.com/register/114202440>

Wednesday, July 31st, 10:00-11:00 AM (PDT), “Riparian Mapping for Climate Adaptation Potential – part 2”

This is the second of two webinars (See June 24th above) to introduce the final reports and products of a Riparian Mapping Project, sponsored by the Western Governors Association and two LCCs. The products are an effort to develop high-resolution maps of potential riparian areas, their condition, and their climate adaptation potential, for the Pacific Northwest (Hydrologic Region 17). In the July 31st webinar, Meade Krosby (University of Washington) will present methods and results for riparian climate-corridor mapping. Webex information for this meeting has not yet been established – look for it in the July Climate Newsletter, or ask to be on the distribution list from Meade at mkrosby@u.washington.edu.

September 5-6, 2013, 4th Annual Pacific Northwest Climate Science Conference, Portland

The 4th annual Pacific Northwest Climate Science Conference will be held in Portland 5-6 September 2013. The conference provides a forum for researchers and practitioners to convene and exchange scientific results, challenges, and solutions related to the impacts of climate on people, natural resources, and infrastructure in the Pacific Northwest. The conference attracts a wide range of participants including policy- and decision-makers, resource managers, and scientists, from public agencies, sovereign tribal nations, non-governmental organizations, and more. We seek presentations, either oral or poster, that describe the region's climate variability and change over time; connections between climate and forest, water, fish, and wildlife resources; climate-related natural hazards such as wildfire, drought, flooding, invasive species and shoreline change; and the emerging science of ocean acidification. **We also seek case studies of efforts to incorporate climate science into planning, policy, and resource management programs and decisions; new approaches to data mining or data development; decision support tools and services related to climate adaptation; and fresh approaches or new understanding of the challenges of communicating climate science.** We invite you to suggest or organize a cluster of abstracts around a theme that might be used to design a special session. Abstract submission is now open. Registration and lodging information will be available soon. See <http://pnwclimateconference.org/>.

Recorded Webinars

Next Generation of Climate Models

A webinar sponsored by the Oregon Climate Change Research Institute (OCCRI) and the Climate Impacts Research Consortium (CIRC) on climate scenarios was offered October 30, 2012. It provided an overview of a new downscaled dataset from the next generation of climate models, and a summary of projected changes and uncertainty in climate variables for the PNW. A recording of the webinar is available in two parts: overview and technical details.

Click [here](#) to access the webinars.

If you missed the May 28 presentation **by USFS-Dan Isaak on Pacific Northwest stream temperatures and climate change** see: <http://bit.ly/C3webinars>

RESOURCES

Climate Impacts Research Consortium CIRC releases inaugural issue of PNW Climate Outlook (attached)

The goal is to provide a seasonal wrap up of relevant regional issues along with an outlook for the coming season in Idaho, Oregon, Washington and Western Montana. The current issue covers spring impacts to water supply and agricultural, and the wildfire outlook for summer 2013. The authors note that this is the first attempt to provide relevant seasonal information and feedback is encouraged to help improve future issues.

Climate Adaptation Knowledge Exchange

CAKE is a community website for natural resource managers founded by [EcoAdapt](#) and [Island Press](#). Contained within CAKE are case studies of adaptation efforts, a library of resources, and directory of organizations and online tools for making adaptation decisions. See the CAKE website [here](#).

North Bay Climate Adaptation Initiative (NBCAI) releases Climate Smart Fact Sheet Series

The fact sheets provide practical advice for citizens based on projected climatic change in the North Bay, and can be accessed from the California Climate Commons website (look for the highlights section on the right).

<http://climate.calcommons.org/>. The fact sheets are entitled:

- *Healthy Forests in a Changing Climate: for People who steward forestland*
- *Rivers, Creeks and Climate Change: for people who live near waterways*
- *Climate Change in the North Bay: for residents of Marin, Sonoma, and Napa Counties*
- *Policy Issues in a Changing Climate: for voters, elected officials, planners, and policy makers*

Helping forests gain ground on climate change

Researchers in Canada have developed guidelines for use by foresters and the timber industry to get a jump on climate change when planting trees. Maps provide projections of climatically suitable habitat for tree species based on climate predictions for the 2020s, 2050s and 2080s. Currently, Alberta forestry companies and government agencies plant 80 million spruce, fir and pine seedlings to reforest more than 50,000 hectares of harvested land annually. The study addresses concerns that many populations of wide-ranging tree species, which are adapted to local growing conditions, may now or in the future actually lag behind their optimal growing environment because of changing temperature and precipitation conditions. The work is the first of its kind to tackle multiple potential climate scenarios for a large number of tree species across western North America.....> [full story](#)

CLIMATE SCIENCE NEWS

Wildland Fire Emissions, Carbon, and Climate: Wildfire–Climate Interactions

Increasing wildfire activity in recent decades, partially related to extended droughts, along with concern over potential impacts of future climate change on fire activity has resulted in increased attention on fire–climate interactions. This paper reviews findings from studies published in recent years on the understanding of fire–climate interactions and our capacity to delineate probable future climate change and impacts. Fires are projected to increase in many regions of the globe under a changing climate due to the greenhouse effect. Burned areas in the western US could increase by more than 50% by the middle of this century. The paper also focusses on fire activity as not simply an outcome of the changing climate, but also a participant in the change. (Lui et al., march 30, 2013 in press, Forest and Ecology Management, <http://dx.doi.org/10.1016/j.foreco.2013.02.020>)

Elevated Carbon Dioxide Making Arid Regions Greener

Scientists have long suspected that a flourishing of green foliage around the globe, observed since the early 1980s in satellite data, springs at least in part from the increasing concentration of carbon dioxide in Earth's atmosphere. Now, a study of arid regions around the globe finds that a carbon dioxide "fertilization effect" has, indeed, caused a gradual greening from 1982 to 2010. > [full story](#)

Mapping Sea Salt From Orbit: Building Better Ocean And Climate Models

Climate is greatly influenced by the flow of heat energy carried by ocean currents. But precisely quantifying the mixing between the ocean and the atmosphere is hampered by a lack of detail in models of the ocean and of the water cycle. And in both models, knowing the salt content of the water is essential. ... > [full story](#)

SPECIES AND HABITATS

Climate Change Vulnerability of Native and Alien Freshwater Fishes of California: A Systematic Assessment Approach

Freshwater fishes are highly vulnerable to human-caused climate change. Because quantitative data on status and trends are unavailable for most fish species, a systematic assessment approach that incorporates expert knowledge was developed to determine status and future vulnerability to climate change of freshwater fishes in California. Native species were found to have both greater baseline and greater climate change vulnerability than did alien species. Fifty percent of California's native fish fauna was assessed as having critical or high baseline vulnerability to extinction whereas all alien species were classified as being less or least vulnerable. For vulnerability to climate change, 82% of native species were classified as highly vulnerable, compared with only 19% for aliens.

Peter B. Moyle et al., PLoS ONE 8(5): e63883. doi:10.1371/journal.pone.0063883

Climate-Aquatics Blog #43: Part 2, Mechanisms of change in fish populations: Floods and streambed scour during incubation & emergence.

How are changes in watersheds affecting fish? (Dan Isaak, Boise Aquatic Research Lab, Rocky Mountain Research Station, US Forest Service)

No Early Birds Getting the Worms: Songbirds Risk Missing Peak Food Supply

A mismatch between the departure schedules of songbirds and higher spring temperatures at their breeding sites is putting them at risk, according to a new study out of York University. The study, "A Trans-Hemispheric Migratory Songbird Does Not Advance Spring Schedules or Increase Migration Rate in Response to Record-Setting Temperatures at Breeding Sites," published in the journal *PLOS ONE*, tracked the spring migration of purple martins over five years from the Amazon basin to two breeding sites in eastern North America. Aerial insectivores, like purple martins and other swallows, are experiencing strong population declines, particularly species migrating longer distances and populations breeding further north. Scientists have shown in a European species that declines may be due to an inability to advance arrival schedules to match a warming climate. This study provides the first direct evidence of a discrepancy between higher spring temperatures at breeding sites and departure schedules of individual songbirds. [*full story*](#)

Kevin C. Fraser, Cassandra Silverio, Patrick Kramer, Nanette Mickle, Robert Aeppli, Bridget J. M. Stutchbury. A Trans-Hemispheric Migratory Songbird Does Not Advance Spring Schedules or Increase Migration Rate in Response to Record-Setting Temperatures at Breeding Sites. *PLoS ONE*, 2013; 8 (5): e64587 DOI: [10.1371/journal.pone.0064587](https://doi.org/10.1371/journal.pone.0064587)

Rapid adaptation is purple sea urchins' weapon against ocean acidification

In the race against climate change and ocean acidification, some sea urchins may still have a few tricks up their spiny sleeves, suggesting that adaptation will likely play a large role for the sea creatures as the carbon content of the ocean increases. [Read full story](#) in Science Daily.

Acidifying oceans could spell trouble for squid

Acidifying oceans could dramatically impact the world's squid species, according to a new study. Because squid are both ecologically and commercially important, that impact may have far-reaching effects on the ocean environment and coastal economies, the researchers report. [Read full story in Science Daily.](#)

POLICY AND MANAGEMENT - MITIGATION AND ADAPTATION

Climate change causing US wildfire season to last longer, Congress told

“America's wildfire season lasts two months longer than it did 40 years ago and burns up twice as much land as it did in those earlier days because of the hotter, drier conditions produced by climate change” --

Thomas Tidwell, the chief of the United States Forest Service, speaking to the Senate committee on energy and natural resources. (From the UK Guardian).

American environmentalist Bill McKibben wins Sophie Prize for his fight against global warming

American environmentalist Bill McKibben has won the \$100,000 Sophie Prize for being a mobilizing force in the fight against global warming. The award committee commended McKibben for “building a global, social movement, fighting to preserve a sustainable planet.” McKibben, born in 1960, has written widely about the impact of global warming. In 2008, he founded 350.org, an international movement aimed at solving the climate crisis with representatives in some 190 countries. The annual Sophie Prize was created in 1997 to reward efforts for a sustainable future.